

Remarks

Claims 1-55 are pending with this paper. Claims 1-49 (new renumbered 1-50) are rejected. Applicant is amending claims 1, 28, 29, 49, and 43b-51 (now renumbered 44-52).

Applicant is adding claims 53-54 and claim 55, which are supported by the specification as originally filed, *e.g.*, Paragraphs 67-68 and Paragraph 73, respectively.

Applicant acknowledges that claims 50-51 (new renumbered 51-52) would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims and is amending the claims in accordance with the objections. Applicant is requesting withdrawal of the objections of claims 50-51.

Applicant is separately filing an Information Disclosure Statement citing “Ear, Anatomy Of” to clarify the anatomy of the human ear.

Other Amendments

Applicant is amending claim 29 to replace “proving” with “providing” to correct a typographical error.

Claim Objections

The Office Action objects to claims 43 as being misnumbered as 43a and 43b. Applicant is amending claims 43-51 to renumber the claims as 43-52. Applicant requests withdrawal of the objections.

Claim Rejections – 35 U.S.C. § 103

Claims 1-49 (new renumbered as 1-50) as allegedly being unpatentable over U.S.

Patent No. 5,761,298 (Davis).

Regarding claim 1, Applicant is amending claim to include the feature of “an acoustically isolating ear piece coupled to the nozzle, the ear piece being conformable within the ear canal, the ear piece and the housing providing at least 15 dB of acoustic isolation from ambient sound over the range of audible frequencies.” The amendment is supported by the specification as originally filed, *e.g.*, Paragraphs 45-46.

Davis fails to suggest the features of “a nozzle for insertion into an ear canal, the nozzle coupled to the housing;” and an acoustically isolating ear piece coupled to the nozzle, the ear piece being conformable within the ear canal, the ear piece and the housing providing at least 15 dB of acoustic isolation from ambient sound over the range of audible frequencies.” The Office Action alleges (Page 3. Emphasis added):

Regarding claims 1-2, 13, 24, 47 and 49, Davis et al. teaches a communications headset which comprises a housing (32) having a speaker driver (1 13), a nozzle (1 12,46, figure 3A), and an acoustically isolating ear piece (46, figures 4, 5 and col. 6, lines 41-46) coupled to the nozzle (figures 3A, 3B). **Davis does not specifically teach the nozzle (112,46) for insertion into an ear canal. However, Davis does teach that the earbud (46) connecting the acoustic channel (112, figure 3A) is inserted in front of the ear canal for blocking external noises from entering the ear canal (col. 8, lines 61-65).** Since Davis does not restrict to the size for the ear bud (col. 6, lines 43-44), it therefore would have been obvious to one skilled in the art to provide any sizes for the earbud (46) such as the size for inserting into the ear canal for more securing the nozzle (112, 46) to the ear of the wearer and better blocking external noises from entering the ear canal. Further, Davis does not specifically teach that the earpiece (46) and the housing (32) provide at least 15dB of acoustic isolation as claimed. However, Davis does not restrict to the configurations and sizes for the ear piece (46); it therefore would have been obvious to one skilled in the art to provide any configurations and sizes for the earpiece (46) such as the configuration for providing acoustic isolation at least 15 dB or in the range of 15 to 25 dB from ambient sound over the range of audible frequencies for providing the improved frequency characteristics to the device.

Davis merely discusses several embodiments in which ear bud 46 rests against the opening of the ear canal. However, Davis never suggests inserting ear bud 46 into the ear canal. In fig. 1, Davis

discusses providing receiver enclosure 32 with socket 44 in order to adapt ear bud 46 to rest against the opening of the ear canal. (Column 6, lines 32-49.) In fig. 8, Davis discusses ear bud 46 coming to rest in the concha between the tragus and the anti-tragus¹ and directly in front of the opening of the ear canal. (Column 8, lines 48-65.) While Davis discusses a plurality of embodiments of ear bud 46, none of the embodiments suggest insertion into the ear canal. Moreover, Davis teaches away from an invasive device. For example, Davis discusses (Column 1, lines 48-65. Emphasis added.):

Ergonomic considerations in the design of communications headsets include the comfort of the device, the ease of putting the headset on and subsequently adjusting it for use, the stability of retention, the restriction of user mobility resulting from the wearing of the headset, as well as the quality of sound delivered by the device. Comfort and stability of the headset on the ear is believed to be among the most critical ergonomic considerations. Acoustical qualities of communications headsets are often closely dependent on other aspects of the design. For example, the acoustical quality of the sound heard by a user is clearly affected by the nature of the receiver-to-ear seal. **Invasive ear tips provide a good seal, but can suffer from problems of comfort and hygiene.** Non-invasive loudspeaker-type receivers, on the other hand, are more susceptible to acoustical degradation from background-level sound and attenuation of the acoustical wave passing through open space from the receiver to the auditory meatus.

While Davis discusses the prior art limitation of invasive ear tips, Davis fails to discuss any thing about resolving this prior art limitation. Consequently, the Office Action fails to establish a prima facie case of obviousness. Applicant requests reconsideration of claim 1.

Moreover, claim 1 includes the feature of “the ear piece and the housing providing at least 15 dB of acoustic isolation from ambient sound over the range of audible frequencies.” (Emphasis added.) The Office Action alleges that (Page 3. Emphasis added.):

Further, Davis does not specifically teach that the earpiece (46) and the housing (32) provide at least 15 dB of acoustic isolation as claimed. **However, Davis does not restrict to the configurations and sizes for the ear piece (46);** it therefore would have been obvious to one skilled in the art to provide any configurations and sizes for the earpiece (46) such as the configuration for providing acoustic

¹ The concha, tragus, and anti-tragus are contained in the anatomy of the external ear. The concha is the hollow bowl like portion of the outer ear next to the ear canal (which may be referred as the external meatus or external auditory meatus). The tragus is small projection just in front of the ear canal. The anti-tragus is lower cartilaginous edge of the conchal bowl just above the fleshy lobule of the ear. The anatomy of the human ear is shown in greater detail with “Ear, Anatomy Of” as cited in IDS filed in conjunction with this paper.

isolation at least 15 dB or in the range of 15 to 25 dB from ambient sound over the range of audible frequencies for providing the improved frequency characteristics to the device.

Applicant respectfully disagrees. Davis repeatedly describes placement of the receiver or earbud only in the concha (*i.e.*, pinna, or external portions of the ear) (Col. 2, Line 67; Col. 5, Lines 13-14; Col. 9, Lines 2-3, 12, 33-34, Col. 10, Lines 54-55), in the cavuum (*sic*, *i.e.*, cavum concha, or entrance from the concha to the ear canal) (Col 7, Lines 62-53), or contacting the skin of the auditory meatus (*i.e.*, opening of the ear canal) (Col. 8, Lines 61-65). One of ordinary skill in the art would appreciate that such arrangements will not result in the desirable minimum 15 dB isolation, since such arrangements do not explicitly engage the ear canal. In contrast, the specification, as originally filed, discloses 15 – 25 db of isolation when a full acoustical seal is achieved between the sleeve and ear canal. (Paragraph 11.) The specification also discloses arrangements that include housing 902, nozzle 904, and ear piece 906 for providing 15 – 25 dB of acoustic isolation. (Paragraphs 58 and 61.)

Independent claim 28 includes the similar feature of “an acoustically isolating ear piece coupled to the nozzle, the ear piece being conformable within the ear canal.” Also, independent claim 49 (now renumbered 50) includes the feature of “a first acoustically isolating ear piece coupled to the first nozzle, the ear piece being conformable within the ear canal, the first ear piece and the housing providing at least 15 dB of acoustic isolation from ambient sound over the range of audible frequencies. Claims 2-27 and 29-48 depend from claims 1 and 28 and are patentable for at least the above reasons.

Furthermore, regarding dependent claims 16, 21, and 39, the Office Action alleges that (Page 4):

Regarding claims 16, 19-21 and 39, Davis shows a cable (40) as claimed (figures 1, 3A, 3B).

However, Davis fails to suggest any thing about coplanar axes and thus fails to suggest the feature of “wherein the first axis, the second axis and the third axis are coplanar” as included in claims 16 and 39. Regarding dependent claim 21, Davis fails to suggest the feature of “wherein the cable cooperates with the ear piece to support the communications headset on the user.” For example, as shown in fig. 1 of Davis, cable 40 is looped several times and does not appear to be capable of mechanically supporting any thing.

Regarding dependent claims 18 and 46, Davis fails to suggest the feature of “wherein the ear piece solely supports the communications headset on the user.” The Office Action alleges that (Page 5.):

Regarding claims 18 and 46, Davis does not specifically disclose that the earpiece (46) solely supports the headset on the user. However, providing an earpiece solely supporting the headset on the user is known in the art.

While the Office Action attempts to combine prior art teachings with Davis, Davis prevents the ear piece from supporting headset 10. For example, Davis discusses that ball tube 28, socket joint 30, and receiver enclosure 32 enable headset 10 to accommodate a variety of ear sizes, positions, and orientations. Consequently, headset 10 would flop down if on required that the ear piece solely support headset 10.

Regarding dependent claims 24 and 47, Davis fails to suggest the feature of “wherein at least some **ambient** sound is electronically transmitted to the driver.” (Emphasis added.) While Davis shows speaker driver 113, Davis fails to suggest generating ambient sound through speaker driver 113.

Regarding dependent claims 25 and 48, Davis fails to suggest the feature of “wherein the microphone is acoustically isolated from the driver signal and thereby reduces echo to a far-end talker.” While Davis may show microphone 102, which is mechanically isolated from transducer 113, Davis does not suggest acoustically isolating microphone 102 from transducer 113.

Regarding dependent claim 29, Davis fails to suggest the feature of “a cable extending from the housing in the direction of the third axis, the cable providing an input signal to the speaker driver and an output signal from the microphone.” The Office Action alleges that (Page 6.):

Regarding claim 29, Davis shows a cable (40) as claimed (figures 1, 3A, 3B).

However, Davis discusses cable 40, which is placed behind the user’s ear rather than hanging straight down from receiver enclosure 32. (Column 6, lines 7-20.)

Claims 1, 3, 18, and 26 are rejected under 35 U.S.C. 103(a) as allegedly being unpatentable over U.S. Patent No. 3,440,365 (Bryant).

Regarding claim 1, as previously discussed, the claim includes the feature of “an acoustically isolating ear piece coupled to the nozzle, the ear piece being **conformable** within the ear canal, the ear piece and the housing providing at least 15 dB of acoustic isolation from ambient sound over the range of audible frequencies.” (Emphasis added.) The Office Action alleges that (Page 6.):

Regarding claims 1, 18 and 26, Bryan teaches a housing (30) comprising a speaker driver (41), a nozzle (45, 46, 47, 71, 72, 73), and an acoustic isolating earpiece (70). Bryan does not specifically teach that the earpiece (70) and the housing (30) provide at least 15dB of acoustic isolation as claimed. However, Bryan does teach a tight seal between the headset device (10, 30, 70) and the ear of the wearer; it therefore would have been obvious to one skilled in the art to provide any structure for the inserting earpiece (70) and the housing (30) of Bryan such as the structure providing the acoustic isolation at least 15 dB or in the range of 15 to 25 dB from ambient sound over the range of audible frequencies for providing the improved frequency characteristics and a comfort to the wearer.

However, Bryan merely discusses (Column 3, lines 14-19. Emphasis added.):

Advantageously, the plastic ear insert is **molded** to fit the particular ear geometry of the user. This expedient, well known in the hearing headset art, achieves not only the expected superior receiver-to-ear seal, but because of its snug fit provides a point of suspension for the headset proper that is secure, stable, and surprisingly comfortable.

Bryan is limited to a molded ear insert and consequently does suggest the feature of the ear piece being conformable within the ear canal.” Moreover, claims 3, 18, and 26 depend from claim 1 and are patentable for at least the above reasons. Applicant requests reconsideration of claims 1, 3, 18, and 26.

All objections and rejections have been addressed. Hence, it is respectfully submitted that the present application is in condition for allowance, and a notice to that effect is earnestly solicited.

Respectfully submitted,

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